

Meteorological observations at Honolulu.

SEPTEMBER, 1898.

The station is at 21° 18' N., 157° 50' W.; altitude 50 feet.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, -0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10. Two directions of wind, or values of wind force, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is now given as measured at 1 p. m. Greenwich time on the respective dates.

The rain gauge, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During preceding twenty-four hours.									
				Temperature.		Means.		Wind.		Total rainfall.	Average cloudi- ness.	Sea-level pressures.	
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew Point.	Relative humidity.	Prevailing direction.	Maximum force.			Maximum.	Minimum.
1	29.92	74	67.5	82	73	65	67	ne.	3	0.16	6	30.02	29.92
2	29.94	74	67	84	71	64	64	ne.	4	0.08	6	29.94	29.86
3	29.88	68	66	84	72	65	68	nne.	2	0.00	3	29.92	29.82
4	29.92	71	66	84	68	65	70	ne.	3	0.00	3	29.95	29.88
5	29.97	74	68	84	71	65	64	ne.	3	0.00	2	29.99	29.93
6	29.97	73	69	84	72	66	66	ene.	3	0.00	2	29.99	29.91
7	29.98	76	68.5	83	73	66	67	nne.	3	0.01	3	29.98	29.90
8	29.99	73	69	82	72	65	67	ene.	3	0.03	13	30.01	29.93
9	29.95	72	68.5	82	72	65	69	ene-n.	3	0.05	10	29.99	29.93
10	29.96	69	67	84	70	65	69	nne.	3	0.00	1	29.99	29.90
11	29.99	69	67	84	67	67	74	ne.	3	0.00	3	30.01	29.92
12	29.98	74	66	85	66	64.5	62	ne.	3	0.01	3	30.03	29.92
13	29.96	74	69	83	73	66.5	70	ene.	4	0.04	4	30.03	29.95
14	29.98	76	68	83	72	66	68	eue.	5	0.01	7	30.02	29.95
15	29.97	76	68	84	75	65.5	63	nne.	6	0.01	6	30.01	29.93
16	29.92	75	70	83	74	67	66	ene-nne	4	0.04	4	29.97	29.89
17	29.89	75	68	83	73	66	65	nne.	4	0.00	6	29.94	29.86
18	29.95	74	68	84	75	65	64	ne.	3	0.00	3-1	29.95	29.86
19	29.99	74	68	84	74	65.5	65	ne.	3	0.02	3-2	29.99	29.92
20	30.00	75	68	84	71	65.5	65	ne.	3	0.01	6	30.06	29.97
21	30.00	74	69	83	72	65	67	ne.	3-0	0.05	6	30.07	29.97
22	30.03	74	68	83	71	65	66	ne.	4	0.06	5	30.08	29.90
23	30.03	75	68	83	72	65.5	67	no.	3	0.05	3	30.08	29.90
24	29.98	72	70	83	74	66	69	ne.	3	0.04	2	30.07	29.97
25	29.98	71	67	83	71	65	66	ene.	3	0.01	5	30.02	29.94
26	29.90	75	68	82	70	67.5	72	ene.	2	0.10	6	30.02	29.94
27	29.92	73	69	82	72	68	75	nne.	3	0.21	8	30.00	29.91
28	29.94	74	68	83	70	67.5	72	ne.	3	0.16	6	29.98	29.89
29	29.94	75	70	82	72	69	77	ene.	5	0.08	6	29.98	29.90
30	29.99	76	70	82	74	67	71	ene.	5	0.10	8	30.02	29.95
Sums..										1.22			
Means.	29.97	73.2		83.3	71.6	65.8	67.8				4.6	30.00	29.92

Monthly mean temperature (6+2+9)÷3 is 77.2, and the normal mean is 77.3.

OCTOBER, 1898.

	*	+	+							+				
1	30.01	71	69	82	73	67.0	69	.....	5	0.06	5	30.04	29.95
2	29.99	76	69	82	75	68.0	72	ene.	4	0.04	4	30.06	29.97	
3	29.95	74	69	81	73	66.5	67	ene-nne.	3	0.08	3	30.02	29.93	
4	29.96	74	69	82	72	67.5	65	ne.	4	0.48	5	30.00	29.92	
5	29.97	75	70	80	70	67.5	71	ne.	4	0.09	6	30.03	29.95	
6	29.98	74	70	81	72	67.0	71	ene.	5	0.25	5	30.03	29.95	
7	29.99	73	70	80	70	68.0	73	ene.	5	0.16	5	30.04	29.95	
8	30.02	74	69.5	81	72	67.5	73	ene.	5	0.25	0	30.07	29.98	
9	30.02	75	69.5	82	73	66.5	69	ene.	4	0.02	0	30.07	29.99	
10	30.03	75	69.5	81	74	67.0	69	ene.	5	0.01	6	30.09	29.98	
11	30.00	75	68.5	81	73	66.0	67	ne.	4	0.01	4	30.09	29.99	
12	29.97	72	68.5	82	74	66.2	70	ne.	3	0.02	3	30.06	29.96	
13	29.98	66	64	82	71	65.2	74	nne.	3	0.05	2	30.01	29.91	
14	29.96	68	67	84	65	67.0	76	s-nne.	2	0.01	1	30.03	29.90	
15	29.95	74	68	84	67	66.0	65	ne.	3	0.01	5	29.97	29.90	
16	29.96	75	70	82	70	68.0	73	ne.	2	0.11	3	29.97	29.98	
17	29.96	76	68.5	81	74	65.5	65	ne.	3	0.01	4	29.98	29.89	
18	29.94	73	67	82	75	64.5	68	ne.	3	0.00	4	29.99	29.92	
19	29.90	75	68	82	72	65.2	67	ene.	3	0.00	8	29.97	29.88	
20	29.93	70	67	82	72	65.0	71	nne.	3	0.00	9	29.96	29.86	
21	29.97	74	70	82	67	66.7	70	ene.	3	0.01	6	30.01	29.93	
22	29.94	72	71	83	73	70.2	84	ne.	2	0.10	5	30.01	29.93	
23	29.95	72	71	81	71	72.0	84	sw.	1	0.01	8	30.00	29.91	
24	29.96	68	67	83	72	70.2	86	sw-n.	1	0.19	5	29.99	29.92	
25	29.99	72	70	83	67	68.0	73	nne.	1	0.05	2	30.02	29.93	
26	29.99	74	69	81	71	65.1	70	nne.	3	0.01	5	30.06	29.95	
27	29.96	74	68	81	74	65.0	67	ne.	5	0.00	4	30.04	29.95	
28	29.94	69	68	82	74	66.5	68	ne.	3	0.08	3	30.01	29.90	
29	29.95	71	68.5	79	68	66.2	73	ne.	3	0.04	8	30.00	29.89	
30	30.02	75	68	80	70	63.2	63	ne.	5	0.03	3	30.05	29.95	
31	30.06	74	67	80	74	63.5	65	nne.	5	0.00	3	30.08	30.00	
Sums..										2.16				
Means.	29.97	73.1		81.7	71.6	66.7	70.9		§	....	||		

Mean temperature for October (6+2+9)÷3=76.3; normal is 76.6. Mean pressure for October is 29.98; normal is 29.97.

*This pressure is as recorded at 1 p. m., Greenwich time. †These temperatures are observed at 6 a. m., local, or 4:30 p. m., Greenwich time. ‡Beaufort scale. §Mean for the daytime is 3.0. ¶The mean during daylight is 4.8.

OBSERVATIONS AT RIVAS, NICARAGUA.

The records contributed for many years by Dr. Earl Flint, at Rivas, Nicaragua, include barometric readings. His present station is at 11° 26' N., 85° 47' W. The observations at 7:17 a. m., local time are simultaneous with Greenwich 1 p. m. The altitude of his barometer is 36 meters above sea level, but until the barometer has been compared with a standard it seems hardly necessary to publish the daily readings. The wind force is recorded on the Beaufort scale, 0-12. When cloudiness is less than $\frac{1}{10}$, the letter "F," or "Few," is recorded.

This station is situated on the western shore of Lake Nicaragua, not far from the eastern end of the western division of the Nicaragua Canal. The volcano Ometepe, on an island in Lake Nicaragua, is about 10 miles northeast of the station. Mr. Flint's records occasionally mention the presence of clouds in the early morning on the summit of this mountain.

Observations at Rivas, Nicaragua, October, 1898.

OBSERVATIONS AT 7:17 A. M. LOCAL (8 A. M. EASTERN STANDARD) TIME.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.			Daily rainfall.
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.	
1.....	76	73	sw.	0	c.	4	sw.	k.	4	sw.	0.09
2.....	76.5	75	se.	0	c.	5	se.	k.	5	se.	0.34
3.....	76	75	se.	0	c.	5	se.	k.	5	se.	1.60
4.....	75	75	se.	1	.....	.....	.....	k.	10	se.	0.55
5.....	75	74	sw.	0	cs.	10	se.	n.	10	se.	0.09
6.....	75	73	se.	0	.....	.....	.....	ks.	8	se.	0.23
7.....	76	73	nw.	0	.....	.....	.....	k.	8	se.	0.08
8.....	76.5	73	sw.	0	c.	10	sw.	ks.	10	sw.	1.91
9.....	75	73	sw.	0	.....	.....	.....	n.	10	sw.	0.80
10.....	73	70	sw.	2	.....	.....	.....	n.	10	se.	0.63
11.....	75	73	sw.	0	c.	9	sw.	k.	9	sw.	0.43
12.....	74	71	w.	0	cs.	5	se.	.....	.....	.....	0.00
13.....	76	73	sw.	0	.....	.....	.....	k.	10	sw.	0.00
14.....	76	73	sw.	0	.....	.....	.....	k.	10	sw.	1.57
15.....	75	73	se.	0	.....	.....	.....	k.	10	se.	1.65
16.....	76	74	se.	0	.....	.....	.....	k.	10	se.	2.56
17.....	76	75	se.	0	.....	.....	.....	k.	10	se.	0.00
18.....	76	73	sw.	1	.....	.....	.....	n.	10	sw.	0.30
19.....	77	74	se.	1	.....	.....	.....	n.	10	sw.	0.89
20.....	76	74	sw.	0	.....	.....	.....	k.	10	sw.	1.22
21.....	76	73	sw.	0	.....	.....	.....	k, ks.	5	sw.	1.75
22.....	75	73	sw.	0	.....	.....	.....	k.	10	se.	1.78
23.....	75	74	se.	0	.....	.....	.....	ks.	10	se.	0.00
24.....	77	74	se.	0	.....	.....	.....	ks.	10	se.	0.12
25.....	77	74	se.	0	.....	.....	.....	k.	10	se.	0.47
26.....	77	73	s.	0	.....	.....	.....	k.	10	se.	0.00
27.....	78	73	se.	0	cs.	Few	se.	.....	.....	.....	0.00
28.....	74	72	sw.	0	.....	.....	.....	ks.	10	se.	0.98
29.....	73	69	se.	0	c.	Few	se.	.....	.....	.....	0.00
30.....	73	73	sw.	0	c.	1	sw.	k.	6	ne.	0.79
31.....	75	73	sw.	0	cs.	5	sw.	..	.....	.....	0.00
Means ..	75.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Observations at Rivas, Nicaragua, October, 1898—Continued.

OBSERVATIONS AT 7:17 A. M. LOCAL (8 A. M. EASTERN STANDARD) TIME.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.		
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.
22.....	77	74	sw.	0				k.	8	
23.....	77	75	se.	0				k.	10	se.
24.....	78	74	se.	0				k.	10	se.
25.....	78	73	se.	0				k.	10	se.
26.....	78	75	sw.	0	c.	7				
27.....	78	74	se.	0	cs.	6	se.			
28.....	77	74	se.	0	cs.	5	se.			
29.....	78	75	sw.	0	c.	8	e.			
30.....	77.5	74	sw.	0	cs.		sw.			
31.....	78	75	sw.	0	c.		sw.			
Means.....	77.0									

5th, slight earthquake, 9:43 p. m.; 13th, slight earthquake, 4:10 a. m. Every night calm.

Observations at Rivas, Nicaragua, September, 1898.

OBSERVATIONS AT 7:17 A. M. LOCAL (8 A. M. EASTERN STANDARD) TIME.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.			Daily rainfall.
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.	
1.....	80	76	sse.	1				ak.	10	sw.	0.00
2.....	78	74	sse.	1				k.	2	se.	0.44
3.....	78	74	ese.	1	ok.	8	sw.				0.40
4.....	76.5	74	sse.	0				k.	10	sse.	0.00
5.....	76	73	se.	0				ks.	5	se.	0.00
6.....	77	74	sw.	0	cs.	4	sw.	ks.		e.	0.14
7.....	76.5	73	ne.	0	ck.	2	se.				0.21
8.....	78	74	se.	0				k.	10	se.	0.06
9.....	75.5	73	nw.	0				ks.	10	se.	1.38
10.....	74	72	sw.	0				k.	5	se.	0.00
11.....	76.5	73	sw.	0				ks.	10	sw.	0.80
12.....	76	73	sw.	0				ks.	8	sw.	0.20
13.....	76	75	sse.	0				ks.	10	sse.	0.00
14.....	74.5	72	sse.	0				k.	10	sse.	1.28
15.....	75	75	sw.	0				k.	10	sse.	1.77
16.....	76	73	sw.	0				ks.	9	sw.	0.38
17.....	76	73	se.	0				ks.	9	se.	0.59
18.....	79	75	se.	1				ks.	10	se.	0.00
19.....	80	74	se.	0				k.	9	se.	0.37
20.....	76	73	se.	0	as.	1		k.	2	se.	3.16
21.....	75	74	se.	0				p.	10	se.	0.87
22.....	76	74	nw.	0				ks.	10	w.	0.43
23.....	77	73	sw.	0				k.	10	sw.	0.30
24.....	76.5	73	sw.	0				ks.	9	sw.	0.00
25.....	75.5	73	sw.	0				ks.		sw.	0.00
26.....	78	77	se.	0				k.	8	se.	1.28
27.....	76.5	74	sw.	0				k.	9	sw.	0.90
28.....	76	74	sw.	0				k.	10	sse.	0.09
29.....	76	73	sw.	0				k.	Few	sw.	0.00
30.....	78	76	sw.	0				k.	Few	sw.	0.70
Means..	76.6										18.99

OBSERVATIONS AT 8 P. M. LOCAL (9 P. M. EASTERN STANDARD) TIME.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.		
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.
1.....	79	75	se.	1	ck.	10	se.			
2.....	78	75	se.	1				k.	10	se.
3.....	78	75	se.	1				k.	10	se.
4.....	77.5	74	se.	0				k.	10	se.
5.....	78	75	sw.	0				k.	10	sw.
6.....	78	74	sw.	0				k.	10	se.
7.....	78	75	se.	0				k.	10	se.
8.....	78	75	se.	0				k.	10	se.
9.....	79.5	75	nw.	0				ks.	10	se.
10.....	79	75	sw.	0		10	sw.		10	sw.
11.....	77	74	sw.	0		10	sw.		10	sw.
12.....	77	74	sw.	0				n.	10	
13.....	74.5	73	sse.	0				k.	10	
14.....	77	74	sw.	0				k.	10	
15.....	77	74	sw.	0				k.	10	
16.....	78	75	sw.	0		8		k.	8	

Observations at Rivas, Nicaragua, 1898—Continued.

OBSERVATIONS AT 8 P. M. LOCAL (9 P. M. EASTERN STANDARD) TIME.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.		
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.
17.....	79	76	sse.	0				a.	Few.	se.
18.....	80	76	se.	1		10	se.		10	se.
19.....	78	75	se.	0		10			10	
20.....	77	74	sw.	0				n.	10	
21.....	78	75	se.	0				k.	10	
22.....	78	75	sw.	0				k.	10	
23.....	77	74	sw.	0				k.	10	
24.....	77	74	sw.	0	c.	5				
25.....	78	75	sw.	0	c.	10				
26.....	76	73	s.	0				n.	10	
27.....	76	75	se.	0				n.	10	
28.....	76	73	sw.	0				a.	2	
29.....	78	75	sw.	0				ks.	9	
30.....	79	75	sw.	0	cs.	10	se.			
Means.....	78.1									

CLIMATOLOGICAL DATA FROM PLAYA RICA, ECUADOR.

By Mr. D. C. STAPLETON.

We are indebted to Mr. D. C. Stapleton, Vice President of the Playa Oro Mining Company, at Playa Rica, Ecuador, for the following interesting climatological summary:

Our office here is located on the Santiago River a trifle less than one degree north of the equator and about 40 miles inland from the Pacific coast, at a known elevation of 260 feet above the sea; from this point toward the sea the river falls 200 feet in the first 23 miles. Above here the river ascends very rapidly—a perfect mountain stream—but carrying a large volume of water. The surface of the earth is most densely wooded, impossible of penetration in some parts until a trail has been cut out with machete and axe and is very rough.

We maintain on our estate four weather stations, looked after by interested persons, who record the readings of the thermometer three times daily, viz: 6 a. m., 1 p. m., and 6 p. m. [local time?—Ed.]. The precipitation is measured twice daily, 6 a. m. and 6 p. m. Our stations are located as follows: (A) At our office in Playa Rica, elevation 260 feet. (B) At Angostura camp, 4 miles above here, elevation 832 feet, in charge of competent men from the States. (C) At Sepayito camp, 6 miles distant from here, elevation 907 feet, in charge of an engineer from the States. (D) At Lapazo Grande camp, 7 miles from here, elevation 965 feet, in charge of foreman from the States. Excepting the difference in temperature, no doubt due to the difference in altitude, there is little difference in our records of the weather; possibly, also, we have more sunshine in Playa Rica than the higher up stations.

The records at our office station (A) for the past six months may safely be taken as a fair general average, and will give a very good general idea of climatic conditions of this locality, and are as follows:

April.—Total precipitation, 48 inches; daily average, 1.60. Rain fell every day; greatest fall in one day, 5.50 inches, on 17th; least fall on any one day, 0.10 inch, on the 5th and 27th. Temperature, daily average, 6 a. m., 73.5°; 1 p. m., 86.8°; 6 p. m., 79.6°; highest degree reached during month, 92°, at 1 p. m., of 25th; lowest, 71.6°, at 6 a. m., 19th.

May.—True precipitation, 51.10 inches; daily average, 1.65; one day, 30th, no rain fell; greatest fall in one day, 5.00 inches, on 22d. Temperature, daily average, 6 a. m., 75.3°; 1 p. m., 86.0°; 6 p. m., 77.1°. Highest degree reached during the month 90°, at 1 p. m., 2d and 17th; lowest, 72° at 6 a. m., 10th and 17th.

June.—Total precipitation, 34.68 inches; daily average, 1.16; on five days, 14th, 16th, 17th, 18th, 20th, there was no rain—a long dry spell—very unusual. The "oldest inhabitant" reports, it is said, "that at one time there were eleven consecutive days without rain;" all five above dates you would have recorded "trace," according to your system of marking. Greatest fall in one day, 4.02, 24th. Temperature, daily average, 6 a. m., 73.3°; 1 p. m., 86.4°; 6 p. m., 74°; highest degree reached, 90°, 1 p. m., 30th; lowest, 72°, at 23 morning and evening readings.

July.—Total precipitation, 43.55 inches; daily average, 1.41; rain every day; greatest fall in one day, 4.10 on 12th; least fall, 15.00, on 28th. Temperature, daily average, 6 a. m., 74°; 1 p. m., 87°; 6 p. m., 75°; highest degree reached, 91°, 1 p. m. 5th; lowest, 72°, occurred 17 times at morning and evening readings.

August.—Total precipitation, 30.59 inches, daily average, 0.99; two days, 9th and 28th, no rain; greatest fall in one day, 3.05, on 10th. Temperature, daily average, 6 a. m., 74.3°; 1 p. m., 86.7°; 6 p. m., 75°;